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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/776,067	02/02/2001	Behrooz Rezvani	VELCP001X3	9374

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EXAMINER

PATHAK, SUDHANSHU C

ART UNIT	PAPER NUMBER
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2634

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/776,067

Applicant(s)

REZVANI ET AL.

Examiner

Sudhanshu C. Pathak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on February 2nd, 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on February 2nd, 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 2-to-21 are pending in the application.
2. Claim 1 has been cancelled.

Drawings

3. Figures 1 & 2 should be designated by a legend such as "Prior Art" because only that which is known is illustrated.

Corrective Action is required.
4. Figures 3 & 4 designate an "RX" chain to include the element "FRAME/ENCODE" (Fig. 3, element 336 & Fig. 4, elements 440, 444) and "TX" chain to include the element "DEFRAME/DECODE" (Fig. 3, element 332 & Fig. 4, element 434, 428), this should actually be reversed. The "TX" and "RX" transceiver chains are reversed.

Corrective Action is required.

Specification

5. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

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The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract of the disclosure discloses a method and apparatus for x-DSL modem supporting multiple x-DSL line codes, however the abstract does not disclose a concise description of the apparatus as to how the multiple line codes are supported.

6. The specification on Page 6, line 21, refers to Fig. 2, element 212 as an "universal line card", however in Fig. 2, element 212 actually refers to an analog front end (AFE)

Corrective Action is required.

7. The specification on Page 14, line 6-7, refers to "which implement CAP QUAM"; this should actually be "which implement CAP QAM".

Corrective Action is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 2, 10 & 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding to Claims 2 & 10:

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- The claim refers to an xDSL modem comprising a coder for coding digital data in at least DMT and CAP line code.

It is not clear if this implies a xDSL modem comprising a coder for a DMT line code or CAP line code or a modem for coding for DMT and CAP line codes.

- The claim also refers to an xDSL modem comprising a Fourier transform engine operating as a base band-to-carrier band converter, but the claim further refers to xDSL modem comprising a converter coupled to the Fourier transform engine for converting base band-to-carrier band.

It is not clear weather the fourier transform engine operates as a base band-to-carrier band converter or the modem comprises a separate converter coupled to fourier transform engine for converting base band-to-carrier band.

- The claim refers to an xDSL modem comprising a coder (...and vice-versa), a fourier transform engine (...and vice-versa), a converter (...and vice-versa), and an analog portion (...and vice-versa).

It is not clear what the term "vice-versa" is referring to in terms of each component of the xDSL modem.

Regarding to Claim 6:

- The claim refers to a "frequency domain equalizer (FEQ)....of the modem for time domain equalization (TEQ)".

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The frequency domain equalizer is for frequency domain equalization while a time domain equalizer is implemented for time domain equalization.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2-4, 10-13 & 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannering et al. (6,137,839) in view of Verbin et al. (6,411,657).

Regarding to Claims 2-4, 10-13 & 18-20, Mannering discloses an XDSL modem (Fig. 1a-e & Fig. 2a-c & Column 1, lines 10-15, 35-50) comprising multiple modulation schemes such as discrete multitone (DMT) and carrierless AM/PM (CAP) (Column 4, lines 41-50 & Column 5, lines 1-15 & Column 7, lines 55-65 & Column 8, lines 38-67 & Column 9, lines 15-22 & Column 10, lines 38-57 & Fig. 10d). Mannering also discloses a coder/decoder for coding/decoding both CAP and DMT modulation schemes (Fig. 4a, element 36, 58 & Fig. 4b, element 714, 755 & Column 2, lines 62-67 & Column 3, lines 1-5 & Column 10, lines 50-57 & Fig. 10d). Mannering also discloses the modem for both transmitting and receiving (transceiver) either CAP and/or DMT (Column 11, lines 50-67 & Column 12, lines 20-67 & Fig.

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10d). Mannering also discloses a fourier transform engine coupled to the coder and operating as a base band-to-carrier band converter and vice versa for the digital data encoded in the DMT line code and as a filter for the digital data encoded with the CAP line code (Fig. 4a, elements 38, 56 & Fig. 4b, element 716 & Column 2, lines 63-67 & Column 3, lines 23-50 & Column 4, lines 1-10). Mannering also discloses a digital-to-analog converter (DAC) coupled to the fourier transform block (for DMT) and filter block (for CAP) to convert the digital signal to an analog band signal (Fig. 4a, element 42 & Fig. 4b, element 717 & Fig. 6c, element 614 & Fig. 6d, element 644). Mannering discloses implementing the modem in the DSP containing various programs for implementing different line codes (Column 9, lines 4-14 & Column 10, lines 43-50). However, Mannering does not specifically disclose a converter for converting between base band-to-carrier digital data.

Verbin discloses a high-speed transmitter used in an xDSL transmission system (Column 1, lines 5-40 & Column 4, lines 29-40 & Fig. 1). Verbin also discloses an upconverter for converting between base band-to-carrier digital data (Fig. 1, element 31 & Column 7, lines 20-30). Verbin also discloses a downconverter coupled to a receive path for carrier band-to-base band conversion of the digital data (Fig. 1, element 37 & Column 9, lines 33-46). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Verbin teaches implementing a digital up converter and down converter for converting the base band digital signal to a carrier band digital and vice-versa and this can be implemented in the xDSL

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transceiver as described in Mannering so as to process and up/down convert the baseband signal to an carrier band signal so as to transmit/receive the xDSL signal.

12. Claims 5-9, 14-17 & 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannering et al. (6,137,839) in view of Verbin et al. (6,411,657) in further view of Matsumoto (PG-PUB 2002/0067811).

Regarding to Claims 5-9, 14-17 & 21, Mannering in view of Verbin discloses a xDSL modem for transmitting/receiving signals with multiple modulation schemes including DMT and CAP as described above.

Mannering also discloses a plurality of buffers located throughout the transmit path between the selected one of the coders and the fourier transform engine for buffering the plurality of communication channels for pipelined processing (Fig. 1b, elements "FIFO", "BUFFER" & Fig. 4a, element 36 & Column 7, lines 35-44 & Column 26, lines 60-67). However, Mannering in view of Verbin does not disclose the transmit path to include a gain scaler for scaling DMT sub-symbols and CAP symbols.

Matsumoto discloses a communication apparatus modem for an xDSL communication system such as ADSL (Specification, Page 1, Paragraphs 1-3 & Fig. 's 1-4). Matsumoto also discloses a gain scaler on the transmit path for scaling DMT sub-symbols associated with each DMT symbol (Fig. 4, element 89 & Specification, Page 5, Paragraph 47). Matsumoto further discloses the fourier transform engine converting on the transmit path the scaled DMT sub-symbols supplied by the gain scaler for the digital data in the DMT line code

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(Fig. 4, elements 89, 90 & Specification, Page 6, Paragraph 52). Matsumoto also discloses a frequency domain equalizer (FEQ) on the receive path (Fig.'s 2 & 4, element 66), and a time domain equalizer for time domain equalization (TEQ) (Fig.'s 2 & 4, element 63) for the equalization of symbols (Specification, Page 3, Paragraph 23-24 & Specification, Page 4, Paragraph 31-35). Matsumoto also discloses buffers in the receive and transmit paths so as to provide pipelined processing (Fig. 4, elements 89, 64). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention that Matsumoto teaches implementing a gain scaler in the transmit chain of the xDSL modem and a frequency and time domain equalizers in the receive chain and this can be implemented in the encoder as described in Mannering in view of Verbin so as to provide the required energy so as to map the received symbols in the receiver and to equalizer the time domain and frequency domain distortions of the channel on the received signal. Furthermore, the gain scaler is implemented after the encoder or is included in the encoder and can be implemented after the encoder on both the DMT and/or CAP modulation schemes to provide the IFFT processing (for DMT) and filter processing (for CAP) high gain symbols for transmission over a noisy channel, thus satisfying the limitations of the claim. Furthermore, this can be implemented in the modem as described in Mannering in the component as described in the DMT part of the modem (Fig. 4a, element 58) and in the CAP part of the modem (Fig. 4b, element 750), thus satisfying the limitations of the claims.


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Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhanshu C. Pathak whose telephone number is (571)-272-3038. The examiner can normally be reached on M-F: 9am-6pm.

- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)-272-3056
- The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sudhanshu C. Pathak


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